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(54) **Silk proteins**

(57) The present invention provides silk proteins, as well as nucleic acids encoding these proteins. The present invention also provides recombinant cells and/or organisms which synthesize silk proteins. Silk proteins

of the invention can be used for a variety of purposes such as in the manufacture of personal care products, plastics, textiles and biomedical products.

EP 2 395 014 A3



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 6330

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 May 2012	Examiner Chavanne, Franz
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

 4
EPO FORM 1503 03/02 (P04C01)



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The present search report has been drawn up for all claims				
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 4
EPO FORM 1503 03/82 (P04C01)



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Place of search Munich		Date of completion of the search 11 May 2012	Examiner Chavanne, Franz
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 4
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Place of search Munich		Date of completion of the search 11 May 2012	Examiner Chavanne, Franz
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4
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Place of search Munich		Date of completion of the search 11 May 2012	Examiner Chavanne, Franz
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 4
EPO FORM 1503 03.02 (P04C01)



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EP 11 16 6330

DOCUMENTS CONSIDERED TO BE RELEVANT				
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The present search report has been drawn up for all claims				
Place of search		Date of completion of the search	Examiner	
Munich		11 May 2012	Chavanne, Franz	
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4
EPO FORM 1503 03.82 (P04C01)



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The present search report has been drawn up for all claims				
Place of search Munich		Date of completion of the search 11 May 2012	Examiner Chavanne, Franz	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 May 2012	Examiner Chavanne, Franz
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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 4
EPO FORM 1503 03.82 (P04C01)



Application Number

EP 11 16 6330

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION
SHEET B

Application Number

EP 11 16 6330

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-15(partially)

Polynucleotides of SEQ ID No.15, 16, 35 or 36 encoding silk proteins from honeybee or bumblebee, silk polypeptides comprising a sequence of SEQ ID No.5, 6, 26 or 27, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

2. claims: 1-15(partially)

Polynucleotides of SEQ ID No. 11, 12, 31 or 32 encoding silk proteins from honeybee or Bumblebee, polypeptides comprising a sequence of SEQ ID No.1, 2, 22 or 23, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

3. claims: 1-15(partially)

Polynucleotides of SEQ ID No.48, 49, 64 or 65 encoding silk polypeptides from bulldog ant and weaver ant, polypeptides comprising a sequence of SEQ ID No.40, 41, 56 or 57, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

4. claims: 1-15(partially)

Polynucleotides of SEQ ID No.13, 14, 33 or 34 encoding silk polypeptide from honeybee or bumblebee, polypeptides comprising a sequence of SEQ ID No.3, 4, 24 or 25, vector comprising said polynucleotide, host cell comprising said



LACK OF UNITY OF INVENTION
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

5. claims: 1-15(partially)

Polynucleotides of SEQ ID No.50, 51, 66 or 67 encoding silk polypeptide from bulldog ant or weaver ant, polypeptides comprising a sequence of SEQ ID No.42, 43, 58 or 59, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

6. claims: 1-15(partially)

Polynucleotides of SEQ ID No.52, 53, 68 or 69 encoding silk polypeptides from bulldog ant or weaver ant, polypeptides comprising a sequence of SEQ ID No.44, 45, 60 or 61, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

7. claims: 1-15(partially)

Polynucleotides of SEQ ID No.17, 18, 37, 38 or 76 encoding silk polypeptides from honeybee or bumblebee, polypeptides comprising a sequence of SEQ ID No.7, 8, 28, 29 or 77, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said



LACK OF UNITY OF INVENTION
SHEET B

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

polypeptide, kit comprising said polypeptide or polynucleotide.

8. claims: 1-15(partially)

Polynucleotides of SEQ ID No.54, 55, 70 or 71 encoding silk polypeptides from bulldog ant or weaver ant, polypeptides comprising a sequence of SEQ ID No.46, 47, 62 or 63, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

9. claims: 1-15(partially)

Polynucleotides of SEQ ID No.74 or 75 encoding silk polypeptides from lacewing, polypeptides comprising a sequence of SEQ ID No.72 or 73, vector comprising said polynucleotide, host cell comprising said vector, transgenic plant or non-human animal transfected with said polynucleotide, antibody specifically binding to said polypeptide, silk fiber comprising said polypeptide, copolymer comprising said polypeptide, composition comprising said polypeptide or said polynucleotide, method of treatment based on the use of said polypeptide, kit comprising said polypeptide or polynucleotide.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 16 6330

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-05-2012

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82